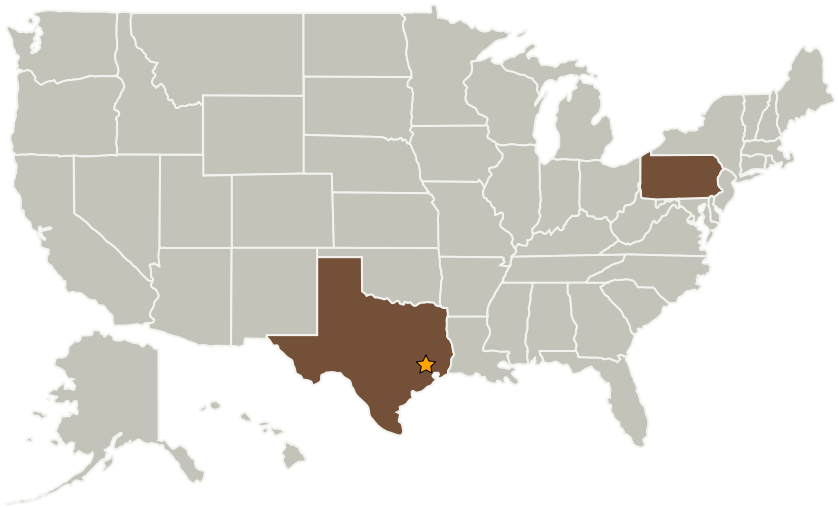
Individualized Fatigue Meter for Space Exploration, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

To ensure mission success, astronauts must maintain a high level of performance even when work-rest schedules result in chronic sleep restriction and circadian misalignment, both of which contribute to fatigue and performance deficits unless effective countermeasures are used. We are proposing to build an Individualized Fatigue Meter that incorporates light inputs, sleep history; physical activity; other physiological inputs; and brief performance tests (e.g. winSCAT, PVT SelfTest) to provide immediate individualized feedback about alertness. For the past 8 years, we have been actively developing many of the system components (funded by NASA, DOD, and NIH) that can be leveraged in this project. The result of this project through Phase II will be a system prototype that can be deployed in space analog environments for validation testing and ultimately deployed on ISS and missions to Moon and Mars. The critical need for an Individualized Fatigue Meter has been identified as a priority outlined in the Behavioral Health and Performance Integrated Research Plan GAP 1.1.1. During Phase I, we will perform a literature review of fatigue monitoring technologies, develop an engineering requirements document, and identify key features of mathematical models needed to design a state-of-art Individualized Fatigue Meter (Phase I TRL of 3-4).

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Pulsar Informatics Inc	Supporting Organization	Industry	

Primary U.S. Work Locations	
Pennsylvania	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.3 Behavioral Health and Performance